

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Referring to item 3 on page 2 of the Office Action, Applicants do not think that 37 CFR 1.78(a)(2) cited by the Examiner covers the present application, which is a national phase application of an international application, rather than a national application claiming the benefit of an international application. In addition, CFR 1.78(a)(2) has been amended to eliminate the requirement that the cross reference must include an indication of whether the international application was published in English. Nevertheless, the cross reference to the international application inserted into the specification by Preliminary Amendment, has been amended to indicate that the international application was published in Japanese.

The claims have been amended to overcome the objection to claims 4-10, 14-17, 21-24 and 28-31 under 37 CFR 1.75(c), as a result of which this objection has been rendered moot.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached pages are captioned "Version with markings to show changes made."

New claims 32-54 have been added to the application.

New claims 32-41 are directed to a molded article formed by molding a propylene-ethylene block copolymer as defined in original claims 1-10, respectively, wherein the flexural modulus of 100-1,200 MPa recited in claim 32 is disclosed at page 29, lines 13-15 of the specification; new claims 42-48 are directed to a molded article formed by molding a polypropylene-ethylene block copolymer as defined in original claims 11-17, respectively, wherein the flexural modulus of 100-1,200 MPa in claim 42 is disclosed at page 29, lines 13-15 of the specification; new claims 49-53 are directed to a molded article formed by molding a propylene-ethylene block copolymer as defined in original claims 18-22, respectively, wherein the flexural modulus of 100-1,200 MPa in claim 49 is disclosed at page 29, lines 13-15 of the specification, and the absence of blushing due to 300% elongation in claim 49 is disclosed at page 37, lines 8-10; and new claim 54 corresponds to original claim 24.

The patentability of the present invention over the disclosure of the reference relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

Thus, the rejection of claims 1-3, 11-13 and 18-20 under 35 U.S.C. §102(e) or 35 U.S.C. §103(a) based on Terano et al. (US 6,211,300) is respectfully traversed.

The polymer of the Terano et al. reference is a block copolymer composition comprising 0.01 to 10% by weight of an A-B propylene-ethylene block copolymer (C) and 99.9 to 90% by weight of a propylene polymer (D).

On the other hand, referring to the designations for I and II for instance on page 1 of the present specification, the polymers of the present invention I and II do not contain a propylene polymer (D) and are not a polymer composition.

The Terano et al. reference states that:

The physical properties of the resulting molded products are inferior to those according to the invention, when a content of an A-B type block copolymer (C) in the propylene-ethylene copolymer composition (E) is less than that according to the present invention. When it is more than that according to the invention, a yield of the total polymers obtained per unit catalyst is lowered. In such case, the molded products are of no practical use. (See column 12, lines 3-10 of the reference)

Thus, the reference does not disclose or suggest molded articles formed by molding a propylene-ethylene block copolymer consisting of polypropylene-b-poly(ethylene-co-propylene) of the present invention which has a low flexural modulus such as 100-1,200 MPa, or molded articles formed by molding a blushing-resistant transparent polypropylene resin which has a flexural modulus of 100-1,200 MPa and exhibits no blushing due to 300% elongation, as in the present invention.

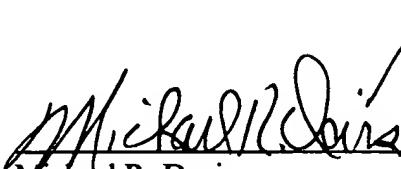
For these reasons, Applicants take the position that the presently claimed invention is clearly patentable over the Terano et al. reference.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of objection and rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

Respectfully submitted,

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Version with Markings to
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--Cross Reference

This application is a 371 application of PCT/JP99/05769 filed October 19, 1999.

→ published in Japanese

Version with Markings to
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Claims

1. A propylene-ethylene block copolymer containing polypropylene-b-poly(ethylene-co-propylene), characterized by having a weight-average molecular weight (Mw) of the propylene-ethylene block copolymer of 100,000 or more; a poly(ethylene-co-propylene) segment content of not less than 5 wt.% and less than 100 wt.%; and a total ethylene content of 2-95 wt.%, wherein the propylene-ethylene block copolymer has the following characteristics (a) and (b):

(a) polypropylene segments and poly(ethylene-co-propylene) segments are linked chemically; and

(b) the polypropylene segments and poly(ethylene-co-propylene) segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component comprising either titanium and a halogen or titanium, magnesium, and a halogen.

2. The propylene-ethylene block copolymer as described in claim 1, wherein the propylene-ethylene block copolymer has a molecular weight distribution index (weight-average molecular weight (Mw)/number-average molecular weight (Mn)) of 3.5 or more.

3. The propylene-ethylene block copolymer as described in claim 1 or 2, wherein the propylene-ethylene block copolymer contains a xylene-soluble component during extraction by use of xylene at 20°C in an amount of 50 wt.% or less.

4. The propylene-ethylene block copolymer as described

in ~~any one of claims 1 to 8~~, wherein the ratio of the poly(ethylene-co-propylene) segments remaining after extraction by use of xylene at 20°C to the segments before extraction is 50 wt.% or more.

5. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the ratio of the total ethylene content remaining after extraction by use of xylene at 20°C to the content before extraction is 50 wt.% or more.

6. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the propylene-ethylene block copolymer has an elution-completion temperature in cross-fractionation chromatography of 100-120°C.

7. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the propylene-ethylene block copolymer has a melting point (T_m) of 135°C or higher.

8. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the propylene-ethylene block copolymer exhibits a melt tension at 190°C of 1.0 g or more.

9. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the peak temperature of complex modulus loss tangent (tan δ) based on glass transition temperature of the PP portion of the propylene-ethylene block copolymer falls within the range of -50°C to 10°C.

10. The propylene-ethylene block copolymer as described in ~~any one of claims 1 to 8~~, wherein the propylene-ethylene block copolymer exhibits a storage modulus (E') at 150°C of

(0.1-30) $\times 10^7$ dyne/cm².

11. A propylene-ethylene block copolymer containing polypropylene-b-poly(ethylene-co-propylene), characterized in that the weight-average molecular weight (M_w) of the propylene-ethylene block copolymer is 100,000 or more; the poly(ethylene-co-propylene) segment content is not less than 5 wt.% and less than 100 wt.%; the total ethylene content is 2-95 wt.%; the molecular weight distribution index (weight-average molecular weight (M_w)/number-average molecular weight (M_n)) is 3.5 or more; the propylene-ethylene block copolymer contains a xylene-soluble component during extraction by use of xylene at 20°C in an amount of 50 wt.% or less; and the ratio of the poly(ethylene-co-propylene) segments remaining after extraction by use of xylene at 20°C to the segments before extraction is 50 wt.% or more.

12. The propylene-ethylene block copolymer as described in claim 11, wherein the ratio of the total ethylene content remaining after extraction by use of xylene at 20°C to the content before extraction is 50 wt.% or more.

13. The propylene-ethylene block copolymer as described in claim 11 or 12, wherein the propylene-ethylene block copolymer has an elution-completion temperature in cross-fractionation chromatography of 100-120°C.

14. The propylene-ethylene block copolymer as described in ~~any one of claims 11 to 13~~, wherein the propylene-ethylene block copolymer has a melting point (T_m) of 135°C or higher.

15. The propylene-ethylene block copolymer as described

in ~~any one of claims 11 to 14~~, wherein the propylene-ethylene block copolymer exhibits a melt tension at 190°C of 1.0 g or more.

16. The propylene-ethylene block copolymer as described in ~~any one of claims 11 to 15~~, wherein the peak temperature of complex modulus loss tangent ($\tan\delta$) based on a glass transition temperature of the PP portion of the propylene-ethylene block copolymer falls within the range of -50°C to 10°C.

17. The propylene-ethylene block copolymer as described in ~~any one of claims 11 to 16~~, wherein the propylene-ethylene block copolymer exhibits a storage modulus (E') at 150°C of $(0.1\text{-}30) \times 10^7$ dyne/cm².

18. A blushing-resistant transparent polypropylene resin for molding containing polypropylene-b-poly(ethylene-co-propylene), characterized by having a poly(ethylene-co-propylene) segment content of polypropylene-b-poly(ethylene-co-propylene) of not less than 5 wt.% and less than 50 wt.% and a total ethylene content of polypropylene-b-poly(ethylene-co-propylene) of 0.25-47 wt.%, wherein the polypropylene-b-poly(ethylene-co-propylene) has the following characteristics (a) and (b):

(a) polypropylene segments and poly(ethylene-co-propylene) segments are linked chemically; and

(b) the polypropylene segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component

comprising either titanium and a halogen or titanium, magnesium, and a halogen, and subsequently, the poly(ethylene-co-propylene) segments are synthesized.

19. The blushing-resistant transparent polypropylene resin for molding as described in claim 18, wherein the polypropylene-b-poly(ethylene-co-propylene) has a weight-average molecular weight (Mw) of 30,000 or more.

20. The blushing-resistant transparent polypropylene resin for molding as described in claim 18 or 19, wherein the polypropylene-b-poly(ethylene-co-propylene) has a molecular weight distribution index (weight-average molecular weight (Mw)/number-average molecular weight (Mn)) of 3.5 or more.

21. The blushing-resistant transparent polypropylene resin for molding as described in ~~any one of claims 18 to 20~~, wherein the polypropylene-b-poly(ethylene-co-propylene) contains a component soluble in xylene at 20°C in an amount of 50 wt.% or less.

22. The blushing-resistant transparent polypropylene resin for molding as described in ~~any one of claims 18 to 21~~, wherein the polypropylene-b-poly(ethylene-co-propylene) has a melting point (Tm) of 135°C or higher.

23. The blushing-resistant transparent molded article formed by molding a blushing-resistant transparent polypropylene resin for molding as recited in ~~any one of claims 18 to 22~~.

24. The blushing-resistant molded article as described in claims 23, wherein molding is carried out through

injection molding.

25. An elastomer for molding containing polypropylene-b-poly(ethylene-co-propylene), characterized by having a poly(ethylene-co-propylene) segment content of polypropylene-b-poly(ethylene-co-propylene) of 50-95 wt.% and a total ethylene content of polypropylene-b-poly(ethylene-co-propylene) of 2.5-95 wt.%, wherein the polypropylene-b-poly(ethylene-co-propylene) has the following characteristics

(a) and (b):

(a) polypropylene segments and poly(ethylene-co-propylene) segments are linked chemically; and

(b) the polypropylene segments are synthesized in the presence of an olefin polymerization catalyst comprising an organometallic compound and a solid catalyst component comprising either titanium and a halogen or titanium, magnesium, and a halogen, and subsequently, the poly(ethylene-co-propylene) segments are synthesized.

26. The elastomer for molding as described in claim 25, wherein the polypropylene-b-poly(ethylene-co-propylene) has a weight-average molecular weight (Mw) of 30,000 or more.

27. The elastomer for molding as described in claim 25 or 26, wherein the polypropylene-b-poly(ethylene-co-propylene) has a molecular weight distribution index (weight-average molecular weight (Mw)/number-average molecular weight (Mn)) of 3.5 or more.

28. The elastomer for molding as described in ~~any one~~ of claims 25 to ~~27~~, wherein the polypropylene-b-

~~1~~
poly(ethylene-co-propylene) contains a component soluble in xylene at 20°C in an amount of 50 wt.% or less.

~~1~~
29. The elastomer for molding as described in ~~any one~~ of claims 25 ~~to~~ 38, wherein the polypropylene-b-poly(ethylene-co-propylene) has a melting point (Tm) of 135°C or higher.

~~1~~
30. The elastomer-molded article formed by molding an elastomer for molding as recited in ~~any one of claims 25 to~~ 38.

~~1~~
31. The elastomer-molded article as described in claim 30, wherein molding is carried out through injection molding.